



N68-S

User Manual

Version 1.1

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- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

ASRock Website: <http://www.asrock.com>

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1. Introduction

Thank you for purchasing ASRock **N68-S** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>
If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
www.asrock.com/support/index.asp

1.1 Package Contents

One ASRock **N68-S** Motherboard
(Micro ATX Form Factor: 9.6-in x 7.0-in, 24.4 cm x 17.8 cm)
One ASRock **N68-S** Quick Installation Guide
Two ASRock **N68-S** Support CD
One 80-conductor Ultra ATA 66/100/133 IDE Ribbon Cable (Optional)
One Serial ATA (SATA) Data Cable (Optional)
One Serial ATA (SATA) HDD Power Cable (Optional)
One I/O Panel Shield

1.2 Specifications

Platform	- Micro ATX Form Factor: 9.6-in x 7.0-in, 24.4 cm x 17.8 cm
CPU	- Support for Socket AM2+ / AM2 processors: AMD Phenom™ FX / Phenom / Athlon 64 FX / Athlon 64 X2 Dual-Core / Athlon X2 Dual-Core / Athlon 64 / Sempron processor (see CAUTION 1) - Support for AM3 processors: AMD Phenom™ II X4 / X3 and Athlon II X4 / X3 / X2 processors - Supports AMD's Cool 'n' Quiet™ Technology - FSB 1000 MHz (2.0 GT/s) - Supports Untied Overclocking Technology (see CAUTION 2) - Supports Hyper-Transport Technology
Chipset	- NVIDIA® GeForce 7025 / nForce 630a
Memory	- Dual Channel DDR2 Memory Technology (see CAUTION 3) - 2 x DDR2 DIMM slots - Support DDR2 1066/800/667/533 non-ECC, un-buffered memory (see CAUTION 4) - Max. capacity of system memory: 8GB (see CAUTION 5)
Expansion Slot	- 1 x PCI Express x16 slot - 1 x PCI Express x1 slot - 2 x PCI slots
Graphics	- Integrated NVIDIA® GeForce 7025 graphics - DX9.0 VGA, Pixel Shader 3.0 - Max. shared memory 256MB (see CAUTION 6)
Audio	- 5.1 CH Windows® Vista™ Premium Level HD Audio (VIA® VT1708S / VT1705 Audio Codec)
LAN	- Realtek PHY RTL8201EL / 8201CL - Speed: 10/100 Ethernet - Supports Wake-On-LAN
Rear Panel I/O	I/O Panel - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x Serial Port: COM1 - 1 x VGA Port - 4 x Ready-to-Use USB 2.0 Ports - 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) - HD Audio Jack: Line in / Front Speaker / Microphone

Connector	<ul style="list-style-type: none"> - 4 x Serial ATAII 3.0Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 0+1, RAID 5, JBOD), NCQ and “Hot Plug” functions (see CAUTION 7) - 1 x ATA133 IDE connector (supports 2 x IDE devices) - 1 x Floppy connector - 1 x Print port header - CPU/Chassis FAN connector - 24 pin ATX power connector - 4 pin 12V power connector - CD in header - Front panel audio header - 2 x USB 2.0 headers (support 4 USB 2.0 ports) (see CAUTION 8)
BIOS Feature	<ul style="list-style-type: none"> - 4Mb AMI BIOS - AMI Legal BIOS - Supports “Plug and Play” - ACPI 1.1 Compliance Wake Up Events - Supports jumperfree - SMBIOS 2.3.1 Support - Supports Smart BIOS
Support CD	- Drivers, Utilities, AntiVirus Software (Trial Version)
Unique Feature	<ul style="list-style-type: none"> - ASRock OC Tuner (see CAUTION 9) - Intelligent Energy Saver (see CAUTION 10) - Instant Boot - Hybrid Booster: <ul style="list-style-type: none"> - CPU Frequency Stepless Control (see CAUTION 11) - ASRock U-COP (see CAUTION 12) - Boot Failure Guard (B.F.G.) - ASRock AM2 Boost: ASRock Patented Technology to boost memory performance up to 12.5% (see CAUTION 13)
Hardware Monitor	<ul style="list-style-type: none"> - CPU Temperature Sensing - Chassis Temperature Sensing - CPU Fan Tachometer - Chassis Fan Tachometer - CPU Quiet Fan - Voltage Monitoring: +12V, +5V, +3.3V, Vcore
OS	- Microsoft® Windows® 2000 / XP / XP 64-bit / Vista™ / Vista™ 64-bit compliant
Certifications	- FCC, CE

* For detailed product information, please visit our website: <http://www.asrock.com>

WARNING

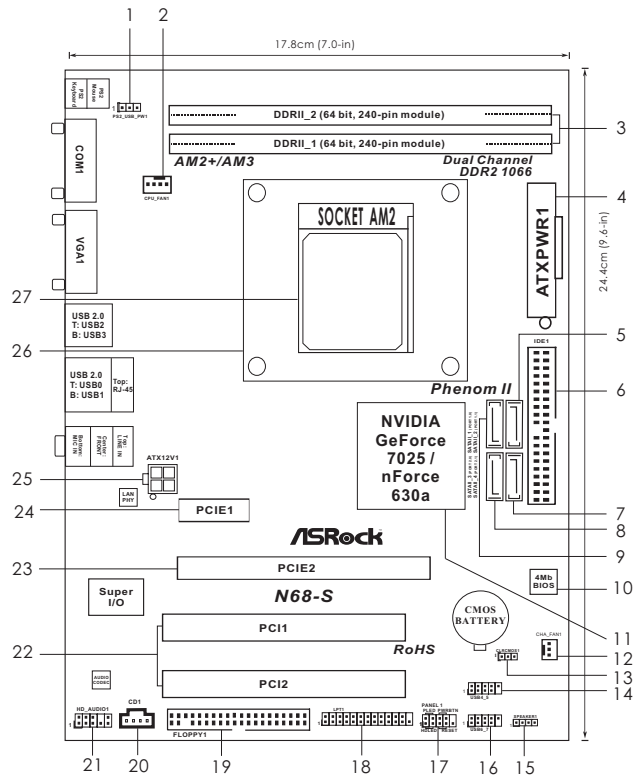
Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using the third-party overclocking tools. Overclocking may affect your system stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

CAUTION!

1. This motherboard supports CPU up to 95W. Please refer to our website for CPU support list. ASRock website <http://www.asrock.com>
2. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 28 for details.
3. This motherboard supports Dual Channel Memory Technology. Before you implement Dual Channel Memory Technology, make sure to read the installation guide of memory modules on page 14 for proper installation.
4. Whether 1066MHz memory speed is supported depends on the AM2+ CPU you adopt. If you want to adopt DDR2 1066 memory module on this motherboard, please refer to the memory support list on our website for the compatible memory modules.
ASRock website <http://www.asrock.com>
5. Due to the operating system limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® XP and Windows® Vista™. For Windows® XP 64-bit and Windows® Vista™ 64-bit with 64-bit CPU, there is no such limitation.
6. The maximum shared memory size is defined by the chipset vendor and is subject to change. Please check NVIDIA® website for the latest information.
7. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 22 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.
8. Power Management for USB 2.0 works fine under Microsoft® Windows® Vista™ 64-bit / Vista™ / XP 64-bit / XP SP1 or SP2 / 2000 SP4.
9. It is a user-friendly ASRock overclocking tool which allows you to surveil your system by hardware monitor function and overclock your hardware devices to get the best system performance under Windows® environment. Please visit our website for the operation procedures of ASRock OC Tuner. ASRock website: <http://www.asrock.com>

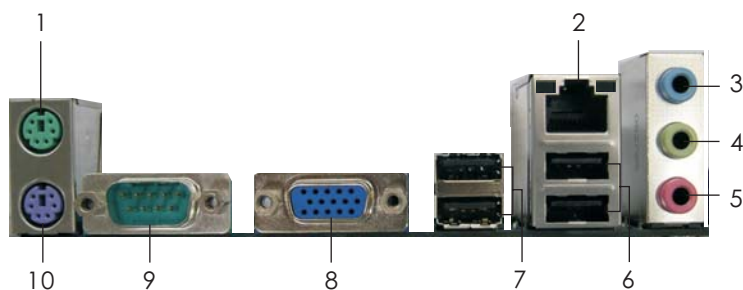
-
10. Featuring an advanced proprietary hardware and software design, Intelligent Energy Saver is a revolutionary technology that delivers unparalleled power savings. The voltage regulator can reduce the number of output phases to improve efficiency when the CPU cores are idle. In other words, it is able to provide exceptional power saving and improve power efficiency without sacrificing computing performance. To use Intelligent Energy Saver function, please enable Cool 'n' Quiet option in the BIOS setup in advance. Please visit our website for the operation procedures of Intelligent Energy Saver.
ASRock website: <http://www.asrock.com>
 11. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.
 12. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.
 13. This motherboard supports ASRock AM2 Boost overclocking technology. If you enable this function in the BIOS setup, the memory performance will improve up to 12.5%, but the effect still depends on the AM2 CPU you adopt. Enabling this function will overclock the chipset/CPU reference clock. However, we can not guarantee the system stability for all CPU/DRAM configurations. If your system is unstable after AM2 Boost function is enabled, it may not be applicative to your system. You may choose to disable this function for keeping the stability of your system.

1.3 Motherboard Layout



- | | | | |
|----|--|----|--|
| 1 | PS2_USB_PW1 Jumper | 15 | Chassis Speaker Header (SPEAKER 1, Purple) |
| 2 | CPU Fan Connector (CPU_FAN1) | 16 | USB 2.0 Header (USB6_7, Blue) |
| 3 | 2 x 240-pin DDR2 DIMM Slots (Dual Channel: DDR2_1, DDR2_2; Yellow) | 17 | System Panel Header (PANEL1, Orange) |
| 4 | ATX Power Connector (ATXPWR1) | 18 | Print Port Header (LPT1, Purple) |
| 5 | SATAII Connector (SATAII_2 (PORT 1.1)) | 19 | Floppy Connector (FLOPPY1) |
| 6 | Primary IDE Connector (IDE1, Blue) | 20 | Internal Audio Connector: CD1 (Black) |
| 7 | SATAII Connector (SATAII_4 (PORT 2.1)) | 21 | Front Panel Audio Header (HD_AUDIO1, Lime) |
| 8 | SATAII Connector (SATAII_3 (PORT 2.0)) | 22 | PCI Slots (PCI1-2) |
| 9 | SATAII Connector (SATAII_1 (PORT 1.0)) | 23 | PCI Express x16 Slot (PCIE2) |
| 10 | SPI Flash Memory (4Mb) | 24 | PCI Express x1 Slot (PCIE1) |
| 11 | NVIDIA GeForce 7025 / nForce 630a | 25 | ATX 12V Power Connector (ATX12V1) |
| 12 | Chassis Fan Connector (CHA_FAN1) | 26 | CPU Heatsink Retention Module |
| 13 | Clear CMOS Jumper (CLRCMOS1) | 27 | AM2 940-Pin CPU Socket |
| 14 | USB 2.0 Header (USB4_5, Blue) | | |

1.4 I/O Panel




- | | |
|---------------------------|--------------------------------|
| 1 PS/2 Mouse Port (Green) | 6 USB 2.0 Ports (USB01) |
| 2 RJ-45 Port | 7 USB 2.0 Ports (USB23) |
| 3 Line In (Light Blue) | 8 VGA Port |
| 4 Front Speaker (Lime) | 9 COM Port |
| * 5 Microphone (Pink) | 10 PS/2 Keyboard Port (Purple) |

To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find "VIA HD Audio Deck" tool on your system. Please follow below instructions according to the OS you install.

For Windows® 2000 / XP / XP 64-bit OS:

Please click "VIA HD Audio Deck" icon , and click "Speaker". Then you are allowed to select "2 Channel" or "4 Channel". Click "Power" to save your change.

For Windows® Vista™ / Vista™ 64-bit OS:

Please click "VIA HD Audio Deck" icon , and click "Advanced Options" on the left side on the bottom. In "Advanced Options" screen, select "Independent Headphone", and click "OK" to save your change.

If you enable Multi-Streaming function, Side Speaker function will be disabled. You can only choose to enable either Multi-Streaming function or Side Speaker function.

2. Installation

This is a Micro ATX form factor (9.6-in x 7.0-in, 24.4 cm x 17.8 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.



Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

2.1 CPU Installation

- Step 1. Unlock the socket by lifting the lever up to a 90° angle.
- Step 2. Position the CPU directly above the socket such that the CPU corner with the golden triangle matches the socket corner with a small triangle.
- Step 3. Carefully insert the CPU into the socket until it fits in place.

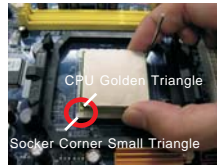


The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins.

- Step 4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



STEP 1:
Lift Up The Socket Lever



STEP 2 / STEP 3:
Match The CPU Golden Triangle To The Socket Corner Small Triangle



STEP 4:
Push Down And Lock The Socket Lever

2.2 Installation of CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU FAN connector (CPU_FAN1, see Page 10, No. 2). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink.

2.3 Installation of Memory Modules (DIMM)

N68-S motherboard provides two 240-pin DDR2 (Double Data Rate 2) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install two **identical** (the same brand, speed, size and chip-type) memory modules in the DDR2 DIMM slots to activate Dual Channel Memory Technology. Otherwise, it will operate at single channel mode.



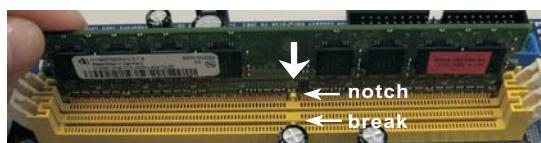
1. It is not allowed to install a DDR memory module into DDR2 slot; otherwise, this motherboard and DIMM may be damaged.
2. If you install only one memory module or two non-identical memory modules, it is unable to activate the Dual Channel Memory Technology.

Installing a DIMM



Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

- Step 1. Unlock a DIMM slot by pressing the retaining clips outward.
- Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

- Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

2.4 Expansion Slots (PCI and PCI Express Slots)

There are 2 PCI slots and 2 PCI Express slots on this motherboard.

PCI slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIe slots: PCIe1 (PCIe x1 slot) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card, SATA2 card, etc.

PCIe2 (PCIe x16 slot) is used for PCI Express cards with x16 lane width graphics cards.

Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 3. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 4. Fasten the card to the chassis with screws.

2.5 Easy Multi Monitor Feature

This motherboard supports Multi Monitor upgrade. With the internal onboard VGA and the external add-on PCI Express VGA card, you can easily enjoy the benefits of Multi Monitor feature. Please refer to the following steps to set up a multi monitor environment:

1. Install the NVIDIA® PCI Express VGA card to PCIE2 (PCIE x16 slot). Please refer to page 15 for proper expansion card installation procedures for details.
2. Connect the D-Sub monitor cable to the VGA/D-Sub port on the I/O panel of this motherboard. Connect another D-Sub monitor cable to the VGA/D-Sub connector of the add-on PCI Express VGA card. Connect the DVI-D monitor cable to the VGA/DVI-D connector of the add-on PCI Express VGA card.
3. Boot your system. Press <F2> to enter BIOS setup. Enter "Share Memory" option to adjust the memory capability to [16MB], [32MB], [64MB], [128MB] or [256MB] to enable the function of onboard VGA/D-sub. Please make sure that the value you select is less than the total capability of the system memory. If you do not adjust the BIOS setup, the default value of "Share Memory", [Auto], will disable onboard VGA/D-Sub function when the add-on VGA card is inserted to this motherboard.
4. Install the onboard VGA driver to your system. If you have installed the onboard VGA driver already, there is no need to install it again.
5. Set up a multi-monitor display.

For Windows® 2000 / XP / XP 64-bit OS:

Right click the desktop, choose "Properties", and select the "Settings" tab so that you can adjust the parameters of the multi-monitor according to the steps below.

- A. Click the "Identify" button to display a large number on each monitor.
- B. Right-click the display icon in the Display Properties dialog that you wish to be your primary monitor, and then select "Primary". When you use multiple monitors with your card, one monitor will always be Primary, and all additional monitors will be designated as Secondary.
- C. Select the display icon identified by the number 2.
- D. Click "Extend my Windows desktop onto this monitor".
- E. Right-click the display icon and select "Attached", if necessary.
- F. Set the "Screen Resolution" and "Color Quality" as appropriate for the second monitor. Click "Apply" or "OK" to apply these new values.
- G. Repeat steps C through E for the display icon identified by the number one, two and three.

For Windows® Vista™ / Vista™ 64-bit OS:

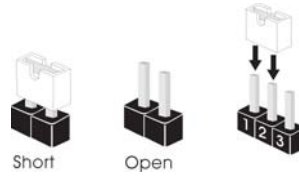
Right click the desktop, choose "Personalize", and select the "Display Settings" tab so that you can adjust the parameters of the multi-monitor according to the steps below.

- A. Click the number "2" icon.

- B. Click the items "This is my main monitor" and "Extend the desktop onto this monitor".
 - C. Click "OK" to save your change.
 - D. Repeat steps A through C for the display icon identified by the number one, two and three.
6. Use Multi Monitor feature. Click and drag the display icons to positions representing the physical setup of your monitors that you would like to use. The placement of display icons determines how you move items from one monitor to another.

2.6 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



Jumper	Setting	
PS2_USB_PW1 (see p.10, No. 1)	<div style="display: inline-block; text-align: center;"> <p>1 2</p> <p>+5V</p> </div> <div style="display: inline-block; text-align: center; margin-left: 20px;"> <p>2 3</p> <p>+5VSB</p> </div>	Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events.

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

Clear CMOS Jumper (CLR CMOS1) (see p.10, No. 13)	<div style="display: inline-block; text-align: center;"> <p>1 2</p> <p>Default</p> </div> <div style="display: inline-block; text-align: center; margin-left: 20px;"> <p>2 3</p> <p>Clear CMOS</p> </div>
--	---

Note: CLR CMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLR CMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action.

2.7 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

Floppy Connector

(33-pin FLOPPY1)

(see p.10 No. 19)



↑
the red-striped side to Pin1

Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE connector (Blue)

(39-pin IDE1, see p.10 No. 6)



connect the blue end
to the motherboard



connect the black end
to the IDE devices

80-conductor ATA 66/100/133 cable

Note: Please refer to the instruction of your IDE device vendor for the details.

Serial ATAII Connectors

(SATAII_1 (PORT 1.0):

see p.10, No. 9)

(SATAII_2 (PORT 1.1):

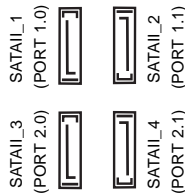
see p.10, No. 5)

(SATAII_3 (PORT 2.0):

see p.10, No. 8)

(SATAII_4 (PORT 2.1):

see p.10, No. 7)



These four Serial ATAII (SATAII)

connectors support SATAII or SATA hard disk for internal storage devices. The current SATAII interface allows up to 3.0 Gb/s data transfer rate.

Serial ATA (SATA)

Data Cable

(Optional)



Either end of the SATA data cable can be connected to the SATA / SATAII hard disk or the SATAII connector on the motherboard.

Serial ATA (SATA)

Power Cable

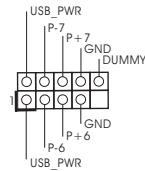
(Optional)



Please connect the black end of SATA power cable to the power connector on each drive. Then connect the white end of SATA power cable to the power connector of the power supply.

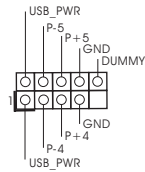
USB 2.0 Headers

(9-pin USB6_7)
(see p.10 No. 16)



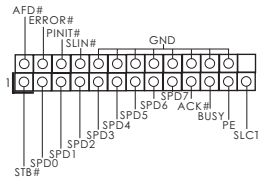
Besides four default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

(9-pin USB4_5)
(see p.10 No. 14)



Print Port Header

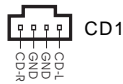
(25-pin LPT1)
(see p.10 No. 18)



This is an interface for print port cable that allows convenient connection of printer devices.

Internal Audio Connectors

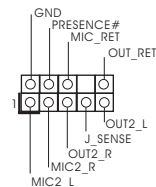
(4-pin CD1)
(CD1: see p.10 No. 20)



This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.

Front Panel Audio Header

(9-pin HD_AUDIO1)
(see p.10, No. 21)



This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.



1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
 - A. Connect Mic_IN (MIC) to MIC2_L.
 - B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
 - C. Connect Ground (GND) to Ground (GND).
 - D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.

